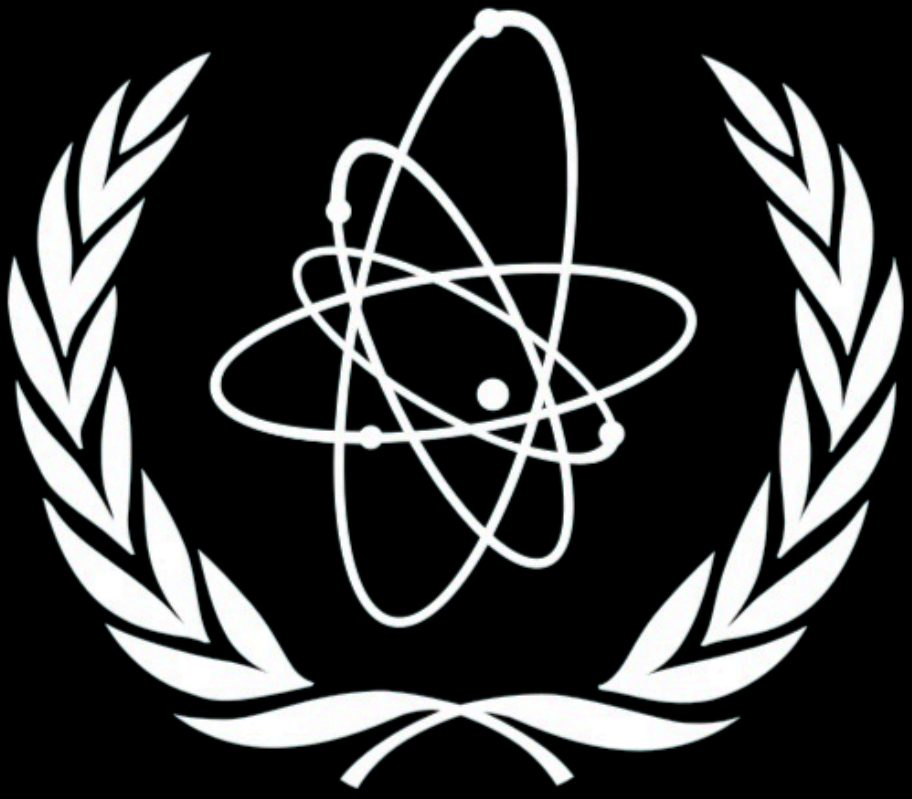
GWH JMUN 2025

BACKGROUND GUIDE

Historical International Atomic Energy Agency (H-IAEA)



Agenda: Discussing Nuclear Accidents with special reference to the Fukushima Incident.

Freeze Date: April 2011

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LETTER FROM EXECUTIVE BOARD

Dear Delegates,

It gives us immense pleasure to welcome you to the International Atomic Energy Agency of Greenwood High Junior Model United Nations 2025. The agenda has been set after careful deliberation. Having been an overarching issue in the international community since the founding of the United Nations, there exists a dire need to deliberate nuclear accidents and safeguards we can take in light of the Fukushima Incident.

This background guide aims to provide an overview of the agenda and has been carefully curated to give you an understanding of what we expect to see discussed in committee. However, this guide should in no way be your sole source of research. It is a tool used to begin your research and give you a glimpse of the varying aspects that can be potentially discussed. We sincerely hope that this document will aid you well.

We encourage you to approach this vast agenda with unique perspectives and innovative solutions. We will be looking for cooperation among delegates to agree or disagree on a comprehensive and concrete plan to tackle nuclear accidents. Please note that any research you will do should be data from before April 2011 as that is the freeze date of the committee. So any events or proceedings after 2011 have not occurred and should not be brought up in committee.

While aware that this agenda is tricky to navigate, we will devote ourselves to making this a unique and memorable experience for all delegates. We wish you the best of luck and feel free to reach out to the Executive Board in case of any queries.

Regards,
The Executive Board

Head Chair: Vipran Vasan - vipranvasan123@gmail.com
Co-Vice Chair: Nihar Sreeram - nihrob2015@gmail.com
Co-Vice Chair: Navaneeth Srinath - navaneethsrinath@gmail.com

Note: This committee does not require position papers

RULES OF PROCEDURE

The RoP for this committee shall be the same as any conventional UN committee. The Rules of Procedure followed are similar to the UNA for USA procedure prevalently followed in the Indian Model UN circuit. The procedure is as follows:

Roll Call

The committee will begin with a roll call, which is similar to attendance being taken. A roll call is taken to establish a quorum (minimum number of members required to begin a session) for the committee. This will also help in finding the majority during motions (explained below).

In the role call, delegates will provide their voting stance. Every delegate in the committee must vote either “Present” or “Present and Voting”. This is a stance that the delegate will take for their final vote on the Draft Resolution at the end of the second day

1. *Present And Voting:* The delegate has to vote either yes or no and cannot abstain during substantive voting
2. *Present:* A Delegate that is declared "Present" shall vote in favor, against, or may abstain on any substantive matter.

If a delegate has voted present on the first day, then they can revert their voting stance to present and voting. However, if a delegate had chosen present and voting on the first day, they must stick with that stance on the second day

Rules Governing Debate

Motions: Motions are commands that are used in a MUN conference to help the committee debate flow and proceedings. Motions are passed, or taken into action when there is a majority voting for it. There are various types of motions and below are the most common ones that will be used throughout the committee.

- *Motion to Open Debate:* This is the first motion of the session to start the formal proceedings of the committee. This motion is generally passed at the discretion of the Dias Members or the Chairperson.

- *Motion to Open General Speakers' List:* This is the first step to establish the Formal Debate on the agenda that has been set up for the committee. This list is non-exhaustible and closes after the closing procedure of the committee.

- *Motion to begin Moderated Caucus:* This motion is raised to focus the discussion on a specific topic within the mandate of the agenda. The purpose of this motion is to discuss various important aspects of the agenda in detail.

- *Motion to begin Unmoderated Caucus:* This is a form of informal debate that is not moderated by the Dias Members. In this type of debate, there are no formal proceedings that are followed. It is raised for a particular amount of time.

- *Motion to begin Voting Procedures:* After the amendments are discussed and voted on, the resolution is put to a vote. The Member States who voted 'Present and Voting 'during the roll call may vote YES or NO on the resolution. The member states who voted 'Present 'may ABSTAIN from voting on the resolution.

- *Motion to Adjourn the Session:* This motion is raised at the end of the committee session to adjourn the session until the next meeting. It is passed on a simple majority or at the discretion of the Chairperson.

- *Motion to Close Debate:* This motion is raised when the committee is over with the debating session and moves into the voting procedure for the Draft Resolution.

- *Motion to Suspend Debate Session:* This motion is raised to postpone all the committee proceedings for the rest of the committee sessions. It is usually raised at the end of the conference.

Moderated Caucus:

A Moderated Caucus is a debate format where delegates make short speeches on specific topics. These specific topics are sub-agendas to the main agenda set by the committee. Delegates raise a motion to start a Moderated Caucus for a specific period after which the Chair would recognize speakers to speak in the Caucus.

The format for raising a motion to begin a moderated caucus is as follows: “The delegate of [country] wishes to raise a motion to begin a moderated caucus on the topic “[topic for the moderated caucus]” with [a certain number] of speakers and individual speaker time of [amount of time for each speed, usually 60 seconds]”

Unmoderated Caucus:

An Unmoderated Caucus, as the name suggests, is not moderated by the Dais. Rules of the formal debate are suspended and delegates are allowed to freely converse with other members of the committee. This time period is used by the delegates to lobby amongst the committee

members. An Unmoderated Caucus is also used by delegates to work on working papers and Draft Resolutions.

The format for raising a motion to begin an unmoderated caucus is as follows:

"The delegate of [country] wishes to raise a motion to begin an unmoderated caucus for a duration of [time, can vary between 5-30 minutes]".

Points

Points are tools that can be used by delegates to increase their understanding of the happenings of the committee. The format for raising a point remains the same. The Executive Board will ask 'Are there any points on the floor", and then the delegates will subsequently raise their placards. Then, they will say "Point of [the point they want to raise]……".

There are four main types of points: *Point of Personal Privilege, Point of Order, Point of Information,* and *Point of Parliamentary Inquiry*

Point of Personal Privilege

This point is raised only when a delegate feels personal discomfort. For example, if the delegate wants the fan to be turned on or if the AC is too cold.

Point of Order

A point of order is raised after a speech has been made if a delegate has said something wrong.

1. *Factual Inaccuracy:* If the speaker makes a factually incorrect statement. For example: - "There are 15 billion people on earth"

2. *Logical Fallacy:* If the speaker makes a logically fallacious statement. For example: - “We will take 3000 camels from Saudi Arabia to the United States in 1 hour by road”. Logical Fallacies however can be tricky as they may rely on opinions and beliefs

The format for raising a point of order is as follows:
“Point of Order, [type of point of order], the delegate stated in their speech that “[verbatim quote of what the delegate said in their speech]”, however, that is [factually inaccurate/logically fallacious] because [explanation]”

Point of Information

This point is raised by delegates when they have a question about the delegate’s speech. The delegate who raises a point of information in a speech will simply ask a question to the other delegate after they have been recognized. However, the question must solely be on the speech given.

Point of Parliamentary Inquiry

This point is raised when a delegate has a question regarding the proceedings of the committee such as a question regarding who the next speaker on the list is or inquiring about how much time is left for the caucus to end.

Procedural Voting

All delegates have one vote on a procedural motion (all motions). It is mandatory to vote on all procedural motions and abstentions are not allowed. Votes on procedural matters are expressed by simply raising their placards. A simple majority is required for a procedural motion to pass.

Substantive Voting

Votes that have the potential for action outside the debate, such as a vote on Draft Resolutions, amendments, or motions that modify resolution content. All delegates have one vote and members may either vote Yes, No, or Abstain. Member States that have been declared as “Present and Voting” do not have the option to Abstain. There needs to be 2/3rd majority for a draft resolution to pass

Draft Resolution

A draft resolution is a document that contains all the issues that the committee wants to solve and the proposed solutions to those issues. It is the final culmination of the debate at the conference. It’s usually completed and voted upon during the last day of the conference.
For each draft resolution, there are sponsors and signatories

Sponsors: The delegates who have made a majority of the draft resolution and lead their group/bloc

Signatory: The delegates who are interested in seeing the draft resolution be tabled in the committee. Note: A delegate from a bloc can be a signatory of a resolution of another bloc. 2/3rd of a committee need to be signatories of a resolution for it to be displayed in committee

Clauses

There are two types of clauses in a draft resolution:

P*re-ambulatory Clauses:* State all the issues that the committee wants to resolve on this issue. It may state reasons why the committee is working on this issue and highlight previous international actions on the issue.

Operative Clauses: State the solutions that the bloc of the resolution proposes to resolve the issue. The operative clauses should address the issues specified in the pre-ambulatory clauses.

For voting on a draft resolution, a “motion to table resolution [name of the resolution]” is raised. Once this motion passes, the sponsors will come up to the front and present the draft resolution. Following this, there may be points of information asked to the sponsors which they need to answer.

Amendments

Following this, there are amendments to the resolution. An amendment is a statement that adds, deletes or changes an operative clause in a draft resolution. A delegate that raises an amendment needs to specify the type of amendment and what the amendment is by pointing out the precise article they want to amend. There are two types of amendments:

1. *Friendly Amendment*: The sponsors agree with the amendment and the change is made.

2. *Unfriend Amendment:* The sponsors disagree with the amendment. These amendments need to be voted upon in committee and there needs to be a 2/3rd majority for an unfriendly amendment to pass.

Note: If 2/3rds of a resolution has been amended, then the resolution will be scrapped entirely.
A sample draft resolution and the conventions for the format have been listed at the end of this document.

INTRODUCTION TO COMMITTEE

The International Atomic Energy Agency (IAEA) is an intergovernmental organization that promotes the peaceful use of nuclear energy while preventing its use for military purposes. Established on 29th July 1957, the IAEA has worked with its member states and multiple partners worldwide for its cause. Nuclear weapons and their non-proliferation were among the key missions that founded the United Nations. Now, the IAEA is working tirelessly towards achieving this goal.

The IAEA is an autonomous organization within the United Nations system but is not a direct committee of the UN. Nonetheless, the IAEA directly reports to the general assembly and the Security Council.

It is important to note that the IAEA is a recommendatory body which means that the IAEA can offer recommendations for situations and make referrals to the United Nations Security Council for taking action. However, the IAEA has put out its safeguards for nuclear facilities and can conduct annual checks according to the Statute of the IAEA - the legal document that establishes the IAEA and its mission. For more details read the Statute and the Legalities section of this background guide.

INTRODUCTION TO THE AGENDA

FREEZE DATE:- APRIL 2011

The agenda of this committee is: ***"Discussing Nuclear accidents with special reference to the Fukushima Incident.".***
This is a meeting of the IAEA called after the Fukushima Incident and all discussions will take place at that time. This means that no information, treaties, or alliances after April 2011 cannot be brought up in committee. This is a special challenge that you delegates will need to undertake during your research and the committee proceedings.

Though there is no one agreed definition, a nuclear accident is "any accident involving facilities or activities from which a release of radioactive material occurs or is likely to occur" according to the IAEA Safety Glossary. This means that anything from a reactor meltdown to a nuclear bomb explosion can be considered a nuclear accident. Nuclear Accidents have been ranked by the International Nuclear and Radiological Event Scale (INES) into 7 levels.

A Level 1 incident on the INES involves minimal environmental and socioeconomic impact, with quick recovery. A Level 7 incident, on the other hand, causes extensive environmental damage, severe economic disruptions, and long-term recovery, taking decades to fully address.
Severe nuclear accidents can be extremely catastrophic, so this committee's goal is to discuss solutions regarding nuclear accidents and how they can be stopped or their impact can be limited so that in the future we can avoid level 7 incidents like Chernobyl or Fukushima.

TIMELINE

1789: Martin Klaproth discovered uranium and named it after the planet Uranus.

1895-1896: Wilhelm Röntgen discovered X-rays, and Henri Becquerel discovered beta radiation and alpha particles from pitchblende.

1898: Pierre and Marie Curie coined the term 'radioactivity' and isolated polonium and radium.

1898: Samuel Prescott demonstrated that radiation destroyed bacteria in food.

1902-1919: Ernest Rutherford identified radioactivity as a nuclear event and discovered nuclear rearrangement with alpha particles.

1940's: Niels Bohr developed the understanding of electron arrangements in atoms.

1911: Frederick Soddy discovered isotopes in radioactive elements.

1913: George de Hevesy demonstrated the usefulness of radionuclides as tracers in scientific studies.

1932: James Chadwick discovered the neutron.

1932: Cockcroft and Walton achieved nuclear transformations with accelerated protons.

1934: Irene Curie and Frédéric Joliot produced artificial radionuclides.

1935-1938: Enrico Fermi formed various artificial radionuclides using neutrons.

1938: Otto Hahn and Fritz Strassmann identified atomic fission with lighter elements such as barium.

1939: Lise Meitner and Otto Frisch calculated the energy release from fission.

1939: Hahn and Strassmann demonstrated neutron multiplication in fission, confirmed by Joliot and Szilard.

1939: Francis Perrin introduced the concept of critical mass for sustaining a chain reaction.

1940-1941: Carl Friedrich von Weizsäcker theorized about plutonium as an explosive material.

1940-1941: The USSR created a committee to investigate uranium.

1940-1941: British scientists produced the MAUD Reports on uranium for bombs and reactors.

1942: The US Army began overseeing atomic bomb development under the Manhattan Project.

1942: Enrico Fermi's team achieved the first nuclear chain reaction in Chicago.1942: Stalin approves a modest atomic bomb research program after reports of similar efforts in Germany, Britain, and the USA. Igor Kurchatov is appointed to lead the project.

1942-1944: Sabotage of German Heavy Water Production - British and Norwegian forces conduct multiple operations to sabotage the Vemork heavy water plant in Norway, which was critical for Nazi Germany's atomic bomb project. Successful attacks in 1943 and 1944 significantly hinder German nuclear ambitions.

1943: US-UK Collaboration Agreement: An agreement formalized the exchange of atomic research between the USA and Britain.

1943: Laboratory No. 2 (later Kurchatov Institute) is established near Moscow for atomic research.

1945: Outcome of Manhattan Project: The first atomic bombs, utilizing U-235 and Pu-239, were developed and used.

1945 (May): Nazi Germany is defeated; German scientists are brought into the Soviet bomb program, focusing on isotope separation and gas centrifuge technology.

1945 (August): The bombing of Hiroshima and Nagasaki accelerates Soviet efforts. Construction begins on Chelyabinsk-65, the first plutonium production facility.

1946 (December): The F-1 reactor, built for plutonium production, begins operation in Moscow.

1947: A test site is established near Semipalatinsk, Kazakhstan.

1947-1949: The Soviet Union supports the establishment of Israel, becoming one of the first countries to recognize it. However, relations soured after the 1967 Arab-Israeli War, leading to a 24-year rupture during which the USSR armed Arab nations against Israel.

1949 (August): The first Soviet atomic bomb, RSD-1, was successfully tested.

1950's–60's: Israel begins its nuclear program; the Soviet Union supports Arab states' nuclear ambitions.

1951 (December): The USA's Experimental Breeder Reactor (EBR-1) becomes the first reactor to produce electricity.

1953: U.S. President Dwight D. Eisenhower delivered the "Atoms for Peace" speech at the United Nations General Assembly on December 8, proposing an international atomic agency to promote peaceful nuclear energy and prevent nuclear weapons proliferation.

1954 (June): The Soviet Union's AM-1 reactor at Obninsk becomes the world's first nuclear power plant to generate electricity.

1955: The BR-1 fast neutron reactor begins operation in the USSR for research purposes.

1955: West Germany establishes its nuclear energy program, creating the Federal Ministry for Nuclear Energy to oversee research and reactor construction.

1956: North Korea establishes its nuclear program with the help of the Soviet Union, focusing initially on peaceful applications of nuclear technology.

1956: The IAEA Statute is opened for signature on October 26, with 81 countries signing, showcasing widespread international support for the agency's creation.

1956: Following the Suez Crisis, France seeks military and intelligence cooperation with Israel. In exchange for Israeli support in the conflict, France agrees to provide Israel with nuclear technology, including a small research reactor.

1957: The International Atomic Energy Agency (IAEA) is formally established on July 29 in Vienna, Austria, as an autonomous organization promoting peaceful nuclear energy use and implementing safeguards to prevent military use of nuclear materials.

1957: The USA builds the first commercial PWR which operates until 1982. A Pressurized Water Reactor (PWR) is one of the most common types of nuclear reactors used for generating electricity. In a PWR, water is used as both a coolant and a neutron moderator, kept under high pressure to prevent it from boiling. This allows the reactor to operate at high temperatures while maintaining liquid water as a coolant. The heated water is then used to produce steam in a secondary loop, which drives turbines to generate electricity.

1957: Windscale Fire (United Kingdom) - A fire at the Windscale Piles reactor releases radioactive contamination into the environment. Although there are no immediate deaths, it is estimated to have caused up to 240 cancer cases over the long term.

1957: Kyshtym Disaster (Soviet Union) - A cooling system failure at the Mayak nuclear complex leads to an explosion in a waste storage tank, releasing radioactive materials over a wide area. The Soviet government initially concealed the incident, resulting in delayed evacuations and health impacts for local populations.

1957 (October): France and Israel finalize their nuclear cooperation agreement. France commits to supplying Israel with a larger heavy-water reactor (EL-102) and a reprocessing plant, allowing Israel to produce plutonium. This agreement is kept secret to avoid international scrutiny.

1957-1960: Construction begins on the Negev Nuclear Research Center near Dimona, Israel. French engineers assist in building the reactor and reprocessing facilities, which are intended for peaceful purposes but raise suspicions about Israel's nuclear weapons ambitions.

1959: The Soviet Union provides North Korea with a small research reactor, marking the beginning of its nuclear research capabilities.

1960: The first commercial PWR (Yankee Rowe) and Boiling Water Reactor (Dresden-1) are commissioned in the USA.

1960: Israeli Prime Minister David Ben-Gurion publicly acknowledges the existence of the Dimona reactor, claiming it is for peaceful purposes. However, the secrecy surrounding its construction leads to widespread speculation about Israel's nuclear capabilities.

1961: U.S. begins imposing restrictions on the export of uranium for non-civilian purposes.

1961: Goldsboro Incident (January 24), A B-52 bomber carrying two nuclear bombs crashes near Goldsboro, North Carolina, after losing a wing. One bomb's parachute fails, causing it to break apart on impact, while the other bomb's safety mechanisms fail. Defense Secretary Robert McNamara later states that "by the slightest margin of chance, literally the failure of two wires to cross, a nuclear explosion was averted".

1961: The first German nuclear power plant begins operation in Kahl, marking the start of commercial nuclear energy in the country.

1962: The Kahl reactor goes online, becoming Germany's first commercial nuclear power plant. The following years see rapid development, with new plants being commissioned almost annually.

1962: Canada introduces its first CANDU reactor using natural uranium and heavy water.

1963: Partial Nuclear Test Ban Treaty (PTBT) was signed to ban nuclear tests in the atmosphere, underwater, and in space.

1963: France halts uranium supply to Israel amid changing political dynamics under President Charles de Gaulle, who demands that Israel allow international inspections of its nuclear facilities.

1964: In response to the cessation of French uranium supplies, Israel begins seeking alternative sources of fissile material from other countries, including Britain and Norway.

1964: The Soviet Union builds its first PWR (VVER) at Novovoronezh and a boiling water reactor at Beloyarsk.

1964: China conducts its first successful nuclear test, becoming the fifth country to possess nuclear weapons.

1965: North Korea begins to develop its own nuclear weapons program, with a focus on building a plutonium production reactor at Yongbyon.

1965: B-43 Bomb Incident: (February) A U.S. Navy aircraft carrier experiences an incident where a B43 thermonuclear bomb is accidentally dropped into the Philippine Sea during a training exercise. The bomb is never recovered.

1967: The construction of the Yongbyon Nuclear Research Center is completed, which includes a 5 MW(e) reactor intended for plutonium production.

1968: Thule Air Base Incident: (May 22) A U.S. Air Force B-52 bomber crashes near Thule Air Base in Greenland due to an onboard fire. The aircraft was carrying a thermonuclear bomb, which is lost in the crash. Although the bomb does not detonate, the incident raises concerns about radioactive contamination in the area

1970: The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is opened for signature, designating the IAEA as the organization responsible for monitoring compliance with the treaty's safeguards provisions, emphasizing its role in non-proliferation efforts.

1970: China signs the Nuclear Non-Proliferation Treaty (NPT), committing to non-proliferation while maintaining a policy of minimum deterrence. Despite the signing, China continues to develop its nuclear capabilities, emphasizing a "no first use" policy.

1970: Soviet K-8 Submarine Incident - On April 8, a fire broke out on the Soviet K-8 nuclear-powered submarine while submerged in the Bay of Biscay. The submarine eventually sinks with four nuclear torpedoes onboard, raising concerns about the potential release of radioactive materials.

1970-1971: The first anti-nuclear protests occur in Germany, signaling growing public concern over nuclear energy.

1972: The BN-350 fast neutron reactor in Kazakhstan becomes the world's first commercial prototype for electricity and seawater desalination.

1973: The USSR commissions its first large RBMK reactor near Leningrad. The RBMK (Reaktor Bolshoy Moshchnosti Kanalny) is a type of nuclear reactor designed and used primarily in the former Soviet Union. It is a graphite-moderated, water-cooled reactor that was notable for its large size and ability to produce both electricity and plutonium.

1974: India conducts its first nuclear test, using fissile material and highlighting gaps in the NPT’s safeguards.

1974: Iraq begins constructing the Osirak nuclear reactor with French assistance.

1974: North Korea signs the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) but does not comply with its safeguards, leading to suspicions about its intentions.

1974: The German government initiated a nuclear consensus aimed at addressing safety and waste management issues related to nuclear energy.

1975: The Nuclear Suppliers Group (NSG), a voluntary association of 48 countries that aims to prevent the proliferation of nuclear weapons through the regulation of nuclear-related exports, is established by seven founding members: Canada, Germany, France, Japan, the Soviet Union, the United Kingdom, and the United States. Member states are expected to refuse exports to countries that do not adhere to international monitoring and verification measures. The NSG operates on a consensus basis, meaning all member states must agree on decisions regarding membership and export controls.

1976: France sells Iraq two nuclear reactors, nicknamed Osiris and Isis, which are capable of being used for nuclear weapons development. This raises alarms in Israel regarding the potential threat posed by a nuclear-armed Iraq.

1977: The Nuclear Suppliers Group (NSG) was established to control the export of nuclear materials for peaceful purposes.

1978: North Korea begins constructing a reprocessing facility to extract plutonium from spent fuel rods, further indicating its nuclear ambitions.

1978: Nuclear Weapons Accident at Eglin Air Force Base - On March 16, a B-52 bomber carrying nuclear weapons experiences a malfunction during takeoff and crashes at Eglin Air Force Base in Florida. Fortunately, no detonation occurs.

1979: Three Mile Island Accident (USA) - A partial meltdown occurs at the Three Mile Island Nuclear Generating Station in Pennsylvania. While no immediate injuries or deaths resulted, the incident raised significant public concern about nuclear safety and led to stricter regulations.

1979: Israeli intelligence begins monitoring the Iraqi nuclear program closely, gathering information on the construction and operational status of the Osirak reactor located 17 kilometers from Baghdad.

1980: The NSG begins to expand its membership and refine its guidelines in response to changing geopolitical circumstances and advancements in nuclear technology.

1980: China begins to modernize its nuclear arsenal, albeit slowly. The lack of transparency regarding its nuclear capabilities leads to concerns among other nations, particularly the U.S. and neighboring countries.

1980: False Missile Alerts - On June 3 and June 6, the U.S. early warning system mistakenly indicates a Soviet missile attack on two occasions, triggering emergency protocols and military readiness actions before being determined as false alarms.

1980: As tensions rise, Israel conducts covert operations to disrupt Iraq's nuclear ambitions, including bombing shipments of nuclear materials and targeting Iraqi scientists. Israeli Prime Minister Menachem Begin becomes increasingly concerned about the reactor's potential to produce nuclear weapons.

1981 (May): Initial plans for an airstrike are developed, but the operation is postponed multiple times due to political considerations and concerns about international backlash.

1981 (June 7):

3:55 PM (local time): Eight Israeli F-16 fighter jets take off from Etzion Air Base in the Sinai Peninsula, heavily armed with bombs and fuel tanks.

6:35 PM (local time): The Israeli jets approach the Osirak facility. They execute a high-speed dive-bombing run, releasing their payloads in a coordinated attack that lasts approximately 90 seconds.

The strike successfully destroys the Osirak reactor, effectively crippling Iraq's nuclear program.

The Israeli pilots return safely without any losses. The operation is hailed as a success within Israel but draws immediate condemnation from the international community, including protests from Iraq and calls for action from other countries.

1982: The Strategic Arms Reduction Talks (START) began on June 29 in Geneva, Switzerland, aimed at reducing the nuclear arsenals of the United States and the Soviet Union.

1983: Soviet False Alarm Incident - On September 26, a Soviet early warning satellite mistakenly indicated that the United States had launched five missiles at the USSR. Lieutenant Colonel Stanislav Petrov decides not to report it as an attack based on his instincts, averting a potential nuclear response that could have escalated into war.

1983: Able Archer Exercise - NATO conducts a command post-exercise simulating a nuclear war scenario. The Soviet Union misinterprets this as a potential real attack due to heightened tensions from previous conflicts, leading to increased military readiness and fears of an accidental escalation into nuclear conflict.

1985: A.Q. Khan Network begins illicitly supplying nuclear technology and fissile material to various countries.

1985: North Korea officially joins the NPT but continues to develop its nuclear capabilities without adhering to the treaty's inspection requirements.

1986: The Yongbyon reactor becomes operational, allowing North Korea to produce plutonium for potential weapons development.

1986: Chernobyl Disaster (Ukraine) - On April 26, a reactor at the Chernobyl Nuclear Power Plant exploded due to a flawed reactor design combined with operator error. This disaster is considered the worst nuclear accident in history, resulting in immediate deaths and long-term health consequences for thousands of people. The disaster leads to widespread radioactive contamination across Europe and forces the evacuation of over 100,000 residents.

1986: The Chernobyl disaster prompts widespread public opposition to nuclear power in Germany, leading to increased scrutiny of existing reactors and safety protocols.

1991: The Soviet Union collapses; Russia emerges as a nuclear technology exporter.

1991: The START I Treaty is signed on July 31 by U.S. President George H.W. Bush and Soviet President Mikhail Gorbachev, committing both nations to reduce deployed strategic nuclear warheads to a maximum of 6,000 each and delivery systems to 1,600.

1992: Russia and Iran sign a bilateral nuclear cooperation agreement, allowing Russia to build a nuclear power plant at Bushehr.

1992: The International Atomic Energy Agency (IAEA) begins inspections in North Korea under the NPT Safeguards Agreement, but access issues arise, leading to increased tensions.

1992: The NSG adopts a set of guidelines for nuclear exports that include provisions for IAEA safeguards, ensuring that recipient states do not divert materials for weapons development.

1993: The START II Treaty is signed in January by U.S. President George H.W. Bush and Russian President Boris Yeltsin, proposing further reductions in nuclear warheads to 3,000-3,500. However, it fails to enter into force due to political disagreements.

1994: Israeli Prime Minister Yitzhak Rabin visits Moscow, marking the normalization of diplomatic relations. Discussions include security concerns related to Iran's nuclear ambitions.

1994: Nunn-Lugar Cooperative Threat Reduction Program begins to secure WMDs and fissile materials in former Soviet states.

1994: The NSG introduces guidelines for the export of nuclear-related dual-use technologies, recognizing the need to control not just nuclear materials but also technologies that could be used in weapon development.

1994: The Agreed Framework was established between the U.S. and North Korea, aiming to freeze North Korea's nuclear program in exchange for aid and light-water reactors. However, compliance issues emerge almost immediately.

1994: START I enters into force on December 5 after ratification by both countries, leading to significant reductions in nuclear arsenals.

1995: A follow-up agreement between Russia and Iran solidifies nuclear cooperation, prompting Israeli officials to urge the U.S. to pressure Russia regarding arms sales and nuclear assistance to Iran.

1995: Russia agrees to help Iran complete the Bushehr nuclear reactor.

1995: U.S.-Russia agreement to downblend 500 tons of highly enriched uranium (HEU) into low-enriched uranium (LEU).

1996: China conducts its last series of nuclear tests, solidifying its nuclear capabilities. The Chinese government emphasizes that its nuclear arsenal is intended for deterrence rather than aggression.

1999: Tokaimura Nuclear Accident (Japan) - A criticality accident occurs at a uranium processing facility due to improper handling of nuclear materials. Two workers die from radiation exposure, and over 600 people are exposed to radiation.

2000: The Social Democrat-Green coalition government, led by Chancellor Gerhard Schröder, agrees on a nuclear phase-out plan (Atomausstieg) that aims to gradually shut down all reactors by 2021.

2001: Following the September 11 attacks in the U.S., the NSG emphasizes the importance of preventing nuclear materials from falling into the hands of terrorist groups.

2002: U.S. officials reveal that North Korea has been secretly enriching uranium, violating the Agreed Framework. This leads to heightened tensions and the eventual collapse of the agreement.

2002: The Strategic Offensive Reductions Treaty (SORT) is signed on May 24 by U.S. President George W. Bush and Russian President Vladimir Putin, mandating reductions in operationally deployed strategic warheads to 1,700-2,200 for each country by 2012.

2003: Invasion of Iraq - The U.S.-led invasion raises concerns about Iraq's alleged weapons of mass destruction (WMD) programs, including nuclear capabilities. The subsequent search reveals no active nuclear program.

2003: North Korea withdraws from the NPT and announces it has nuclear weapons. The Six-Party Talks begin involving China, South Korea, Japan, Russia, and the U.S., aiming to denuclearize the Korean Peninsula.

2005: The NSG faces challenges regarding membership and adherence to non-proliferation norms as countries like India seek to join despite not being signatories to the NPT.

2006: The Iranian nuclear program dominates discussions during Israeli Prime Minister Ehud Olmert's visit to Moscow.

2006: On October 9, North Korea conducts its first nuclear test, confirming its status as a nuclear weapons state and prompting widespread international condemnation and sanctions.

2006: The U.S. Department of Defense reports that the People's Liberation Army (PLA) is modernizing and expanding its nuclear arsenal. This includes new missile systems and improvements in the mobility and survivability of its forces.

2007: Israel conducts Operation Orchard, destroying Syria's suspected nuclear reactor.

2008: The Pentagon's annual report indicates that China is enhancing its nuclear capabilities by developing new types of intercontinental ballistic missiles (ICBMs) and increasing naval force projection with new nuclear-powered submarines.

2009: The Christian Democratic-Free Democrat coalition government under Chancellor Angela Merkel approves an extension of the operational lifespan of existing reactors by an average of 12 years, pushing the shutdown date to 2036.

2009: U.S.-Russia HEU agreement extended to convert HEU into LEU for civilian nuclear use.

2010: Iran faces international scrutiny over its nuclear program, including concerns over illicit fissile material trade.

2010: The New START Treaty is signed on April 8 in Prague by U.S. President Barack Obama and Russian President Dmitry Medvedev, limiting deployed strategic nuclear warheads to 1,550 per side and including verification measures.

2010: The U.S. Department of Defense releases a report stating that the PLA is improving the mobility of its missile forces and engaging in training exercises that enhance its strategic strike capabilities.

2010: Russia and Israel sign a military cooperation agreement, despite Israel's ongoing concerns about Russian arms sales to Iran and Syria.

2010: The Stuxnet computer virus is discovered, reportedly developed by the U.S. and Israel to target Iran's Natanz nuclear facility. The virus damages approximately 1,000 centrifuges used for uranium enrichment.

2011: New START enters into force on January 26 after ratification by both nations, incorporating on-site inspections and data exchanges to ensure compliance.

2011: Fukushima Daiichi Disaster (Japan) - Following a massive earthquake and tsunami on March 11, cooling systems fail at three reactors, leading to core meltdowns and hydrogen explosions. Although there are no immediate deaths from radiation exposure, tens of thousands are evacuated, and long-term environmental and health impacts are still being assessed.
2011: Following the Fukushima disaster in Japan, Germany temporarily shuts down its seven oldest nuclear reactors and accelerates its phase-out plan.

CASE STUDIES

Below are a few case studies which look at different aspects of nuclear accidents to give you delegates a better understanding of various reasons and consequences of nuclear accidents

FUKUSHIMA INCIDENT OF 2011

On March 11th, 2011, A 15-metre tsunami was caused by a major earthquake headed towards the Fukushima Daechii Reactors. It surged over coastal defenses, mainly seawalls employed by the Japanese, and approximately 50 minutes after the magnitude 9.0 earthquake at 14:46. What followed suit was only a display of the underestimation and lack of concrete defenses that were present in the mitigation strategies of the nuclear reactor.

According to the plan, the three operational reactors (Units 1, 2, and 3) automatically shut down. The Emergency Diesel generators were activated to maintain cooling, however, the tsunami managed to disable cooling circuits which caused the plant to overheat from the residual heat from the nuclear reactions. As the temperature rose, Hydrogen Gas Molecules ignited, causing explosions in the core units days after the incident, some on a different date than the other. As a consequence of these explosions, the Japanese expanded their exclusion zone from 20 kilometers to 30 kilometers, causing

major displacement in homes. Warnings from a 2008 report suggested that the plant could be vulnerable to tsunamis above the height of 10 meters, much in the case of the 2011 tsunami which rose up to 12.

However, following this report, no significant upgrades were made to the plant's coastal defenses. Most also claim that the design for the seawall was heavily outdated, with only a maximum height of 3.1 meters, which was then revised to 5.7 in 2002. The magnitude 9.0 earthquake was capable of slightly tilting the earth's axis, cementing the accident, as a series of unfortunate events, with events such as this perceived rare by the mass public. Following the Incident, In 2012, the Japanese established the cabinet-level reconstruction agency, coordinating rebuilding efforts in the Tohuku Region.

Additionally, on September 19th, 2012, the Nuclear Regulation Authority was formed, a regulatory body, which performed many acts to revise nuclear safety laws. The IAEA also endorsed the *IAEA Action Plan on Nuclear Safety*, which outlined actions to strengthen safety in nuclear power programs. Additionally, the Incident garnered a 'level 7 incident' label which puts it on the same page as the Chernobyl Incident. Prior to the incident about 30% of Japan's electricity came from Nuclear Energy. However, after the incident, public sentiment shifted gradually against nuclear energy which led to a temporary shutdown of all reactors. The Japanese Government is also reported to contribute almost 18 trillion yen in reconstruction efforts causing major re-allocation of resources, stunning the possibilities for economic growth. A survey additionally revealed that 34.7% of evacuees experienced salary cuts of 50% or more since the disaster began, which further exemplifies the various flaws that came with the displacement of people living in the fukushima prefecture. Elderly individuals also faced higher mortality rates after the disaster, however no link could be established between this and the fukushima disaster.

CHERNOBYL INCIDENT

On April 26th, 1986, Chernobyl Nuclear Power Plant located in the Soviet Union, which is now modern-day Ukraine, went through a safety test to examine the capabilities of the reactor during a power outage. The Plant adopted a soviet RBMK design which is said to possess many safety deficiencies, such as having a positive void coefficient, when there is an increase of the steam (water vapour) present in the core. A sudden power surge then caused a series of sudden steam explosions which destroyed Reactor No.4.

The operators conducted the test despite possessing the knowledge of the plant's vulnerability and unstable nature. Both the lack of awareness of the design flaws of the reactor itself, and the accusations of poorly-trained employees caused one of the worst nuclear disasters. International Agreements were soon signed, such as the Convention on Early Notification of a Nuclear Accident, and the Assistance Convention. As well as, most importantly, the adoption of the Convention on Nuclear Safety passed by the IAEA which outlines safety protocols a nuclear plant must go through.

The Soviet government also deployed around 600,000 emergency workers, known as "liquidators," to contain the disaster. However, many of these 'liquidators' were exposed to high amounts of radiation while trying to douse the fire causing many untold casualties. The nearby town of Pripyat was also evacuated on April 27th, 1986 due to the possibility of contamination and radiation-induced illnesses. Chernobyl remains uninhabitable to this day, contaminated beyond repair. The USSR also had a critical crisis, where the reactor fuel sunk into the ground and almost poisoned vital water systems such as the Black Sea, and freshwater in lakes in Ukraine.

The incident garnered widespread criticism of the Soviet Government, especially about their competence, including internally. Some believe that the Chernobyl partially caused the breakaway of the SSRs from the Soviet Union, and causing major decentralization and trust in the soviet government. In Belarus, as much as 22% of the national budget went to restoration efforts for Chernobyl in 1991, diverting resources from helping the population, which caused public unrest, and 5-7% of the Ukraine government spending each year goes to Chernobyl, proving that the Chernobyl disaster continues to be a burden on the war-ridden country, shunning it's economic capabilities to aid those in war.

However, what makes this one of the most disturbing incidents is the estimated 20,000 cases of thyroid cancer that were documented in this group due to exposure to radioactive iodine released during the incident, particularly among children under the age of 18 at the time of the disaster.

THREE MILE ISLAND INCIDENT

At 4:00 am,in the Three Mile Island Nuclear Generating Station in Pennsylvania, a failure in the secondary, non-nuclear section of the plant caused the main feedwater pumps to stop functioning. The mechanism used to transfer heat from the reactor core failed. As a result, the reactor shut down automatically. Following the shutdown, the Pilot Operated Relief Valve (PORV) opened in an attempt to relieve pressure from the reactor. However, due to a technical malfunction, it remained stuck open and as the coolant dropped gradually, the residual decay heat from the nuclear fuel began to cause overheating which caused a partial meltdown of the reactor core.

However, the operators in the control room still had the opportunity to manually close the PORV. Unfortunately, they were misled by the instrumentation present which indicated that the PORV was closed, as well as the absence of visual confirmation of the PORVs status. They also had to deal with over 100 alarms that went off, making it difficult for the operators to assess which ones were critical. The accident released small amounts of radioactivity into the air, however there was no concrete evidence to suggest that there were any detectable health affects among the workers.

However, the NRC knew the deficiencies for some time before the incident but they weren't considered important in the view of NRC strategy and design. The NRC mandated improved training programs for operators in the aftermath of the incident.

The accident also led to the formation of the Institute of Nuclear Power Operations (INPO) in 1979 in response to the highly reputable Kenmeny Report which outlined the exact details of the incident, which boldly criticised the NRC as well as gave findings and recommendations. Following the incident, there was also a Moratorium on the licensing of new nuclear reactors, leading to a halt in nuclear development in the USA, in a pivotal time in the 80s.

The cleanup process of TMI-2 which started in August of 1979, officially concluded in December of 1993, amounting to costs of up to 2 billion dollars in 2023. 39% of the population situated in a 15 mile radius was told to evacuate. The three mile island brought many changes to both the NRC and the Nuclear Strategy of the United States of America, proving to be a pivotal change in for nuclear reactor technology and licensing. However, no radiation-induced illnesses was reported in the area post the disaster.

SL-1 INCIDENT

SL-1 was a small experimental reactor designed for military applications such as providing thermal power of up to 3 MW to remote facilities in Idaho. On the night of January 3rd, the reactor was to undergo a restart after a maintenance shutdown. However, what seemed to be a routine process, turned into a catastrophic human error which caused the death of 3 operators present on the scene. During the process, An operator withdrew the central control rod, which controls the rate of fission to power up a reactor, too quickly and too high, causing the reactor to go from a 'shut-down' status to a prompt-critical state. The rapid withdrawal caused the temperature of the reactor to surge dramatically, which caused an explosive vaporization of water. This vaporization then subsequently caused a catastrophic steam explosion, which hurled the reactor approximately 9 feet into the air.

All three operators present were rendered dead, one was impaled, one succumbed two hours after fatal injuries, and one was killed instantly after being thrown onto a wall. The central control rod was reported to have a high reactivity worth, making it particularly sensitive to withdrawal. Following the incident, the AEC surveyed all licensed reactors in the United States of America to check whether the shutdown procedures were under safe parameters. Additionally, the one control rod design of the SL-1 was later prohibited in future models.

However, the SL-1 showed cracks before the incident occurred, and fuel inspections were ceased due to the difficulty of the removal of assemblies. Additionally the test involved powers of 4.7 MWt, when only 3 MWt was the limited amount. Largely, however, what really went down behind the SL-1 incident still remains a mystery with most speculating on the fast withdrawal

and others suggesting different plausible possibilities.

What remains untold is why the rod was lifted too high and too fast, indicating that only by intentional effort could it happen. What could be the only concrete fact, however, is the three dead bodies found on the scene. Although the SL-1 didn't receive the same media coverage as Three Mile Island or Chernobyl, It still brought major changes to nuclear reactor technology, making sure that incidents like these don't impact the nation in a larger scale in the far future.

INTERNATIONAL LAW

International Law is an intricate part of every MUN. It is the cornerstone of all the documents, decisions, and alliances between countries that we see and know of. For this committee, here are a few relevant international law concepts and treaties but we highly recommend that delegates read up more on international law concerning the agenda that can be brought up in the committee.

KEY WORDS

- *Treaty:* A treaty is an agreement between sovereign states (countries) and in some cases international organizations, which is legally binding by international law.
- *Legally Binding:* Legally binding means a treaty is enforceable by a court of law. If you sign a legally binding treaty and don't fulfill your obligations, then the other party can take you to court for necessary action. In the case of countries, if they violate (don't follow) a treaty, then they can face consequences from sanctions to trade tariffs and sometimes even military action.
- *Ratification:* It is giving formal consent to a treaty or contract, making it officially valid. If a country ratifies a treaty or contract, then that treaty becomes legally binding.

- *Signing:* It is agreeing to comply with a treaty and is mostly a country showing interest in following a treaty, but the treaty is not legally binding for the country. So a country can sign a treaty and not follow its terms without facing major legal consequences.

- *Articles and Subclauses:* An article is the main division of a treaty that addresses a specific aspect of the treaty like rights, obligations, etc. Subclauses are subdivisions within an article to elaborate on the main article. So terms like “Article 3 subclause 5 of xyz treaty” are used to describe a specific point in the treaty.

- *Customary International Law:* It is a body of universal international obligations that every single country must follow regardless of whether they have signed or ratified a treaty. For example, basic human rights, equivalent use of force during armed conflicts, etc. Customary International Law fills up the gaps left by treaties for times of conflict and regular activities of countries.

NUCLEAR NON-PROLIFERATION TREATY (NPT)

The Nuclear Non-Proliferation Treaty is a very important legal document that aims to prevent the spread of nuclear weapons, promote the peaceful use of nuclear energy, and advance nuclear disarmament. It is one of the most widely adhered-to arms control agreements, with 191 parties as of today and almost every major country having signed or ratified it.

However, a few major countries have not signed the NPT: India, Pakistan, Israel, South Sudan, and North Korea. North Korea was a party to the treaty but withdrew in 2003 and it became effective 90 days later.

While the NPT is the cornerstone of nuclear disarmament, it does have its loopholes. For example, it allows the permanent 5 members of the Security Council to possess nuclear weapons while condemning the rest of the nations who don't have the weapons (This is also the reason why India has not signed the NPT)

The enforcement of the treaty is also a serious concern as countries like China and the United States, ratifiers of the treaty, have been growing their nuclear arsenal without any consequences. One loophole was that it does not talk about the testing of nuclear weapons which has been fixed in some manner by the Comprehensive Nuclear-Test-Ban Treaty but it still hasn't been able to enter into force

Countless more loopholes can be brought up in committee which is what we as the Executive Board wish you delegates will do.

CONVENTION ON NULCEAR SAFETY

The Convention on Nuclear Safety is an International Treaty by the IAEA designed to promote the safe operation of nuclear power plants worldwide. It is a treaty that aims to ensure a high level of nuclear safety to prevent nuclear accidents and minimize their potential consequences. It also aims to foster cooperation and transparency among nations regarding nuclear safety measures.

This only aims at land-based civilian nuclear power plants that are in operation or under construction and does not cover nuclear weapons or military-related nuclear activities. mechanisms.
Even with this treaty, there have been multiple nuclear accidents due to a variety of facts which can be a good topic of debate in committee. Whether the fault is due to the shortcomings of international law in treaties like the Convention on Nuclear Safety or due to individual countries' mistakes.

CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT

This is an international treaty made by the IAEA after the Chernobyl nuclear plant accident which establishes a notification system for nuclear accidents, It requires states to report the accident's time, location, nature, and other data essential for assessing the situation. This reporting to the IAEA is mandatory as mentioned in Article 2 of the treaty.

This is extremely important as if a nuclear accident can reach other countries, then there can be serious harm to life. This instant transmission of information will allow countries to limit casualties and help deal with the situation rapidly. This also creates a global standard for emergency preparedness and response in case of nuclear accidents.

The IAEA can also dispatch specialized missions to assist affected countries as part of its broader responsibilities under the Convention on Early Notification of a Nuclear Accident.

QUESTIONS A RESOLUTION MUST ANSWER (QARMAS)

1. What regulations and safety standards can be improved to prevent future accidents?

2. How can international cooperation be enhanced for a faster emergency response to nuclear accidents?

3. What measures should be implemented to address the long-term environmental and public health impacts of nuclear accidents?

4. What steps can be taken to rebuild public trust post-nuclear accidents?

5. How can loopholes and shortcomings of international law be improved to help tackle nuclear accidents better? (Note: The IAEA cannot make any amendments to treaties but it can recommend the Security Council to look into loopholes in treaties)

6. What compensation can be given to countries and individuals affected by nuclear accidents, and what frameworks can be put in place for the accountability of these accidents?

SAMPLE DRAFT RESOLUTION

Title of Draft Resolution

Committee Name

Committee Agenda

Sponsors: (maximum number provided by Chair)

Signatories: (minimum number provided by Chair)

Preambulatory Clauses

Preambulatory Clause Operative Word …. Preambulatory clause,

Operative Clauses

Operative Clause Operative Word … operative clause:

a. Subpart 1,

b. Subpart 2;

Notes:

List of clause keywords:

https://www.wisemee.com/preambulatory-and-operative-clauses/

- You must ensure the keyword is under the mandate of the committee (ex. GA committees can't use "demands")

There will be a minimum number of preambulatory and operative clauses provided

There is no maximum number of subparts for an operative clause

FURTHER READING

The Statute of the IAEA - https://www.iaea.org/about/statute

IAEA on Atomic Energy - https://www.un.org/en/global-issues/atomic-energy

IAEA Safety Glossary -
https://www.iaea.org/resources/publications/iaea-nuclear-safety-and-security-glossary

International Nuclear and Radiological Event Scale -
https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale

History of Nuclear Energy - https://world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy

About Nuclear Regulation Commission -
https://www.nrc.gov/about-nrc.html

Israel's Nuclear History -
https://armscontrolcenter.org/countries/israel/

Nuclear Supplier's Group -
https://www.armscontrol.org/factsheets/nuclear-suppliers-group-nsg-glance

Chinese Nuclear Forces -
https://www.tandfonline.com/doi/full/10.1177/00963402114266630

DPRK Safeguards -
https://www.iaea.org/newscenter/focus/dprk/fact-sheet-on-dprk-nuclear-safeguards

German Nuclear Energy History -
https://www.dw.com/en/german-nuclear-energy-history-a-timeline/a-15117199

Germany abandoning its reactors -
https://www.osw.waw.pl/en/publikacje/analyses/2023-04-21/it-official-germany-abandons-nuclear-energy

Safety of Nuclear reactors - https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors

US - Russia Nuclear arms Timeline -
https://www.cfr.org/timeline/us-russia-nuclear-arms-control

Nuclear Weapon statistics - https://ourworldindata.org/nuclear-weapons

Operation Opera -
https://www.idf.il/en/articles/2023/operation-opera-an-inside-look-into-one-of-the-most-infamous-idf-operations/

Osirak Reactor Airstrike -
https://www.airandspaceforces.com/PDF/MagazineArchive/Documents/2012/April%202012/0412osirak.pdf

French-Israeli Nuclear Cooperation - https://muse.jhu.edu/article/14493/summary

UN on International Law - https://www.un.org/en/global-issues/international-law-and-justice

Draft Conclusion by the International Law Commission on Customary International Law - https://legal.un.org/ilc/texts/instruments/english/commentaries/1_13_2018.pdf

Nuclear Non-Proliferation Treaty - https://www.un.org/en/conf/npt/2005/npttreaty.html

Comprehensive Nuclear Test Ban Treaty - https://disarmament.unoda.org/wmd/nuclear/ctbt/

Convention on Nuclear Safety - https://www.iaea.org/topics/nuclear-safety-conventions/convention-nuclear-safety

Convention on Early Notification of a Nuclear Accident - https://www.iaea.org/topics/nuclear-safety-conventions/convention-early-notification-nuclear-accident

https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident

https://pmc.ncbi.nlm.nih.gov/articles/PMC4426935/

https://www.nrc.gov/docs/ML1835/ML18355A806.pdf

https://www.iaea.org/topics/response/fukushima-daiichi-nuclear-accident

https:/www.iaea.org/topics/nuclear-safety-action-plan

https:/world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident

https:/www.gao.gov/blog/2019/09/12/how-chernobyl-jump-started-the-global-nuclear-safety-regime

https:/www.nrc.gov/reading-rm/doc-collections/fact-sheets/chernobyl-bg.html

https:/world-nuclear.org/information-library/safety-and-security/safety-of-plants/three-mile-island-accident

https:/www.nrc.gov/docs/ML1122/ML11221A325.pdf

https:/www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html

https:/inis.iaea.org/collection/NCLCollectionStore/_Public/11/536/11536450.pdf

https:/www.osti.gov/servlets/purl/5082863%C2%A0

http:/large.stanford.edu/courses/2017/ph241/berrios1/

http:/environmental-defense-institute.org/publications/SL-1Accident.pdf

https:/www.nrc.gov/docs/ML0820/ML082030501.pdf